Notice No.3

Rules and Regulations for the Classification of Ships, July 2022

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Please note that corrigenda amends to paragraphs, Tables and Figures are not shown in their entirety.

Issue date: December 2022

Amendments to	Effective date	IACS/IMO implementation (if applicable)
Part 3, Chapter 2, Section 1	1 July 2023	1 July 2023
Part 3, Chapter 2, Section 2	1 January 2023	N/A
Part 3, Chapter 9, Section 2	1 January 2023	1 January 2023
Part 3, Chapter 9, Sections 3, 6, 9 & 10	1 January 2023	N/A
Part 3, Chapter 10, Section 2	1 January 2023	N/A
Part 3, Chapter 11, Section 8	1 January 2023	N/A
Part 3, Chapter 13, Section 6	1 January 2023	N/A
Part 3, Chapter 16, Sections 3 & 13	1 January 2023	N/A
Part 4, Chapter 1, Sections 1, 3 & 11	1 January 2023	N/A
Part 4, Chapter 2, Section 2	1 January 2023	N/A
Part 4, Chapter 7, Section 1	1 January 2023	N/A
Part 4, Chapter 8, Sections 1, 14 & 15	1 January 2023	N/A
Part 4, Chapter 11, Section 13	1 January 2023	N/A

Part 3, Chapter 2
Materials

■ *Section 1*
Materials of construction

1.2 Steel

1.2.6 Where C, C-Mn and alloy steel castings or forgings are ~~used~~ intended for hull structure applications for ships and offshore units for worldwide service such as sternframes, rudder frames, rudder stocks, propeller shaft brackets and other major structural items, they are to comply with ~~*Ch 4 Steel Castings* or *Ch 5 Steel Forgings* of the Rules for Materials~~ *Ch 4, 2 Castings for ship and other structural applications* or *Ch 5, 2 Forgings for ship and other structural applications* of the *Rules for the Manufacture, Testing and Certification of Materials*, as appropriate.

■ *Section 2*
Fracture control

2.2 Refrigerated spaces

(Part shown)

Table 2.2.1 Material classes and grades

Structural member category		Material class/Minimum grade
ADDITIONAL MINIMUM REQUIREMENTS FOR SHIPS OF LENGTH GREATER THAN 250 m		
E2.	Bilge strake, *see* Note 2	Grade D/DH within ~~0,6~~0,4*L* amidships
Note 2. Single strakes required to be of Grade D/DH or Grade E/EH and within 0,4*L* amidships are to have breadths not less than 800 + 5*L* mm, but need not be greater than 1800 mm, unless limited by the geometry of the ship's design.		

Part 3, Chapter 9
Special Features

■ *Section 2*
Timber deck cargoes

2.2 Refrigerated spaces

2.5 Uprights

2.5.1 Uprights are to be designed in accordance with the *2011 TDC Code – Code of Safe Practice for Ships Carrying Timber Deck Cargoes, 2011 – Resolution A.1048(27)* and the additional notes contained in this sub-Section. They should be used when required by the nature, height or character of the timber deck cargo, as outlined in the *2011 TDC Code – Code of Safe Practice for Ships Carrying Timber Deck Cargoes, 2011 – Resolution A.1048(27)*. ~~Where timber uprights are used, it is the responsibility of the Master to use timber of a type and grade proven satisfactory for the purpose.~~

~~2.5.3 The spacing of the uprights is to be suitable for the length and character of the timber to be carried but is not to exceed 3 m.~~

~~2.5.4 Each upright is to extend above the top of the cargo and be fitted with a strap or bracket support at the top of the bulwark to hold it upright whilst loading.~~

Existing paragraphs 2.5.5 and 2.5.6 have been re-numbered 2.5.3 and 2.5.4.

■ *Section 3*
Decks loaded by ~~wheeled~~ vehicles

3.1 General

3.1.1 Where it is proposed either to stow wheeled or tracked vehicles on the deck or to use wheeled vehicles for cargo handling, the deck and supporting structure are to be designed on the basis of the maximum loading to which they may be subjected in service. Where applicable, the hatch covers are to be similarly designed. In no case, however, are the scantlings to be less than would be required as a weather or cargo deck or hatch cover, as applicable.

3.4 Deck plating

Table 9.3.3 Tyre correction factor, n

Number of wheels in idealised patch	Pneumatic tyres	Solid rubber tyres	Steel or solid tyres
1	0,6	0,8	1,0
2 or more	0,75	0,9	1,0
Note. For tracked vehicles, n is taken as 1,0.			

3.5 Deck longitudinals and beams

Table 9.3.6 Structural design factors

Scenario	f_σ	f_τ	f_δ
1. Loading by fork lift trucks on general purpose cargo decks	1,5	1,5	0,001
2. Loading by wheeled vehicles and other deck cargo	0,75	0,75	
3. Loading by wheeled vehicles only	0,75	0,75	
4. Loading by wheeled vehicles only on longitudinally effective structure	0,525	0,525	
5. Loading by wheeled vehicles and other deck cargo on longitudinally effective structure	0,525	0,525	
Note Structural design factors for ~~shear and~~ equivalent stress are to be derived as appropriate.			

Table 9.3.7 Design load cases

Scenario		Loading	
		UDL, P_{tyw}, in kN/m^2	Point load, F_{tys}, in kN
1. Loading by fork lift trucks on general purpose cargo decks		9,81*h*/*C*	P_w
2. Loading by wheeled vehicles and other deck cargo		9,81*h*/*C* ~~where *h* need not be taken greater than 2,5 metres~~, *see* Note 2	(1 + na_z) P_w
3. Loading by wheeled vehicles only, *see* Note 1	Internal decks	-	(1 + na_z) P_w
	Exposed decks	2,16	(1 + na_z) P_w
4. Loading by wheeled vehicles only on longitudinally effective structure, *see* Note 1	Internal decks	-	(1 + na_z) P_w
	Exposed decks	2,16	(1 + na_z) P_w
5. Loading by wheeled vehicles and other deck cargo on longitudinally effective structure		9,81*h*/*C*, *see* Note 2	(1 + na_z) P_w

Symbols

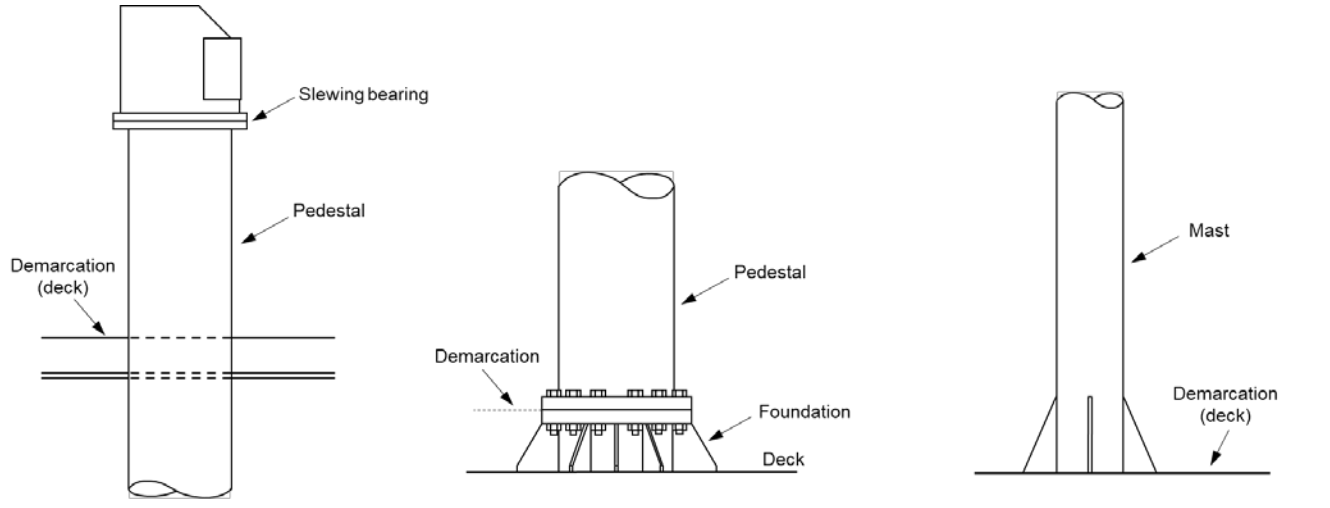
P_w	= is the load, in kN, on the tyre print. For closely spaced wheels, the shaded area shown in *Figure 9.3.1 Tyre print chart* can be taken as the combined print.
h	= is the deck cargo design ~~loading~~head, in m, *see Pt 3, Ch 3, 5 Design loading*
C	= is the stowage factor, *see Pt 3, Ch 3, 5 Design loading*
n	= is the tyre correction factor given in *Table 9.3.3 Tyre correction factor, n*
a_z	= is the vertical acceleration at the location under consideration, *see Pt 3, Ch 9, 9.2 Loading 9.2.3*

Note *1*. Scenario to be assessed using direct calculation, *see Pt 3, Ch 9, 3.5 Deck longitudinals and beams 3.5.3*.
Note *2*. The deck cargo design head, *h*, need not be taken greater than 2,5 metres unless specified otherwise by designer/shipyard.

■ *Section 6*
Lifting appliances and support arrangements

6.1 General

6.1.7 ~~Masts, derrick posts, crane pedestals and similar supporting structures~~ Lifting appliance pedestals and foundations that are welded to the supporting hull structures are classification items, and the scantlings and arrangements are to comply with LR's requirements whether or not LR is also requested to certify or class the lifting appliance and issue the Register of Ship's Lifting Appliances and Cargo Handling Gear, *see Figure 9.6.1 Classification items and applicability of LR's requirements for lifting appliance pedestals and foundations*.



(a) Classification items:
- pedestal up to and excluding the slewing bearing
- classed lifting appliance

(b) Classification items:
- foundation connecting the pedestal and the deck
- classed lifting appliance

(c) Classification items:
- mast, derrick post, king post or similar structure up to and excluding the first non-welded component
- any associated brackets that are welded to the deck
- classed lifting appliance

Note 1: Items below the demarcation are to comply with LR's *Rules and Regulations for the Classification of Ships*.
Note 2: Items above the demarcation are to comply with LR's *Code for Lifting Appliances in a Marine Environment* or LR's *Code for Offshore Personnel Transfer Systems*, as applicable.

Figure 9.6.1 Classification items and applicability of LR's requirements for lifting appliance pedestals and foundations

6.2 ~~Masts, derrick posts and crane pedestals~~ Lifting appliance pedestals and foundations

6.2.1 The scantlings of ~~masts and derrick posts, intended to support derrick booms, conveyor arms and similar loads, and of crane pedestals,~~ lifting appliance pedestals and foundations (such as masts, derrick posts and crane pedestals) are to comply with the requirements of LR's *Code for Lifting Appliances in a Marine Environment* ~~(hereinafter referred to as LAME)~~ or LR's *Code for Offshore Personnel Transfer Systems*, as applicable, *see Figure 9.6.1 Classification items and applicability of LR's requirements for lifting appliance pedestals and foundations*.

~~6.2.2 In addition to the information and plans requested in LR's LAME the following details are to be submitted:~~

~~a. Details of masthouses or other supports for the masts, derrick posts or crane pedestals, together with details of the attachments to the hull structure.~~
~~b. Details of any reinforcement or additional supporting material fitted to the hull structure in way of the mast, derrick post or crane pedestal.~~

6.3 ~~Support Structure~~ Supporting hull structures for ~~masts, derrick posts and lifting appliance pedestals~~ lifting appliance pedestals and foundations

6.3.2 ~~Masts, derrick posts and crane pedestals~~ Lifting appliance pedestals and foundations (such as masts, derrick posts and crane pedestals) are to be efficiently supported and, in general, are to be carried through the deck and satisfactorily ~~scarfed~~integrated into a transverse hold or 'tween deck bulkhead. Alternatively, ~~the masts, derrick posts or crane pedestals~~ lifting appliance pedestals and foundations may be carried into a ~~mast house, in which case the mast house is to be~~ supporting structure of ~~substantial~~

~~construction~~adequate strength, *see Pt 3, Ch 9, 6.3 Supporting hull structures for lifting appliance pedestals and foundations 6.3.4*. Proposals for other support arrangements will be specially considered.

6.3.3 Deck plating and underdeck structure are to be reinforced under ~~masts, derrick posts or crane pedestals~~ lifting appliance pedestals and foundations and, where the deck is penetrated, the deck plating is to be suitably increased locally.

6.3.4 The factored forces and moments resulting from an installed lifting appliance are to be taken into consideration on the basis of LR's *Code for Lifting Appliances in a Marine Environment* or LR's *Code for Offshore Personnel Transfer Systems*, as applicable, when assessing the support arrangements, including the deck plating and underdeck stiffening in way of ~~a~~ the lifting appliance pedestal and foundation. ~~are to be assessed using the same criteria used to assess the lifting appliance pedestal~~ The global hull girder stresses are to be taken into account where applicable, with due consideration given to the material grade, *see also Pt 3, Ch 4 Longitudinal Strength*.

6.3.7 In addition to the information and plans requested in LR's *Code for Lifting Appliances in a Marine Environment* or LR's *Code for Offshore Personnel Transfer Systems*, as applicable, the following details are to be submitted:

(a) Details of the supporting hull structures for lifting appliance pedestals and foundations, together with details of the attachments to the hull structure.
(b) Details of any reinforcement or additional supporting material fitted to the hull structure in way of lifting appliance pedestals and foundations.

6.4 Lifting appliances

6.4.1 Vessels or offshore units fitted with lifting appliances built in accordance with the classification requirements of LR's ~~LAME~~ *Code for Lifting Appliances in a Marine Environment* or LR's *Code for Offshore Personnel Transfer Systems*, as applicable, ~~in respect of structural and machinery requirements~~ will be eligible to be assigned Special Features class notations as listed in *Table 9.6.1 Special features class notations associated with lifting appliances*. This notation will be retained so long as the appliances are found upon examination at the prescribed surveys to be maintained in accordance with LR's requirements.

6.6 Walk-to-Work (W2W)

6.6.5 When considering loads, all expected directions of operation are to be taken into account. The foundation for the transfer system is to be designed in accordance with *Ch 1, 8.3 Pedestals and foundation* of *LR's ~~Code for Lifting Appliances in a Marine Environment, Ch 4, 5.1 General 5.1.6~~ Code for Offshore Personnel Transfer Systems*.

■ *Section 9*
Strengthening for machinery on deck

9.2 Loading

(Part only shown)

9.2.3 The following formulae are given as guidance for the components of acceleration due to ship motions and apply to ships with a length exceeding 50 metres and where the speed is such that the ship is operating within the displacement mode based on normal ship service speed.

A_0, a_{heave}, a_{pitch}, a_{sway}, a_{yaw}, a_{rolly}, $a_{(rollz)}$, f_{st} and A are defined in *Table 9.9.1 Ship motions*.

F_{HS} = ~~is taken as~~ 1 for unrestricted sea going service~~.~~
0,8 for restricted service
0,5 for sheltered waters/harbour conditions

■ *Section 10*
Omission of hatch covers

10.1 Application

10.1.1 Where it is intended to omit hatch covers for one or more cargo holds, the requirements of this Section are to be complied with and the notation **Hatch Covers may be omitted in Hold (No(s) ...)** will be assigned. Attention is drawn to the *Guidance Notes for the Omission of Hatch Covers on General Cargo Ships* and *MSC/Circular.608/Rev.1 – Interim Guidelines for Open-top Containerships – (Adopted on 5 July 1994)*.

Part 3, Chapter 10
Welding and Structural Details

■ *Section 2*
Welding

2.2 Fillet welds

2.2.7 Double continuous fillet welding is to be adopted in the following locations, and may be used elsewhere if desired:

(a) Boundaries of weathertight decks and erections, including hatch coamings, companionways and other openings.

(b) Boundaries of tanks and watertight compartments.

(c) All fillet welds where higher strength steel is used and the global hull girder stress in way of the fillet weld exceeds 175 N/mm^2.

Existing listed items I to (j) have been renumbered as (d) to (k).

Part 3, Chapter 11
Closing Arrangements for Shell, Deck and Bulkheads

■ *Section 8*
Side and stern doors and other shell openings

8.6 Design loads

(Part only shown)

8.6.1 The design force considered for the scantlings of primary members, securing and supporting devices of side shell doors and stern doors are to be taken not less than:

I Design forces for primary members:

External force:

$$P_e = Ap_e + 10W \text{ kN}$$

The symbols used are defined as follows:

p_e = external sea pressure, in kN/m^2, determined at the centre of gravity of the door opening and is not to be taken less than:

= for $Z_G < T$ $10(T - Z_G) + 25$ kN/m^2 $10(T - Z_G) + 25$ kN/m^2

for $Z_G \geq T$ 25 kN/m^2 25 kN/m^2

= For stern doors of ships fitted with bow doors, P_e is not to be taken less than:

p_{emin} = $0{,}6\lambda C_H (0{,}8 + 0{,}6L^{0{,}5})^2$ kN/m^2

Part 3, Chapter 13
Ship Control Systems

■ *Section 6*
Stabiliser structure

Existing sub-Section 6.1 has been deleted and replaced with the below:

6.1 Fin stabilisers

6.1.1 Detailed plans are to be submitted clearly indicating the positions, supporting structures and design loads for retractable and non-retractable fin stabilisers.

6.1.2 The design, construction, operational performance and control of fin stabilisers are outside the scope of classification.

6.1.3 Stabiliser fins are to be positioned so that the openings for the fins is between a pair of transverse watertight bulkheads which form a watertight compartment. Where stabiliser fins extend across watertight bulkheads, these bulkheads are not included in the compartment definition, *see Figure 9.6.1 Stabiliser fin positioning.* If this compartment is subjected to flooding due to stabiliser damage, calculations and information are to be submitted showing that the bulkhead deck does not become submerged and that essential systems remain operational. A water ingress detector and alarm are to be provided, as well as indication on the navigation bridge.

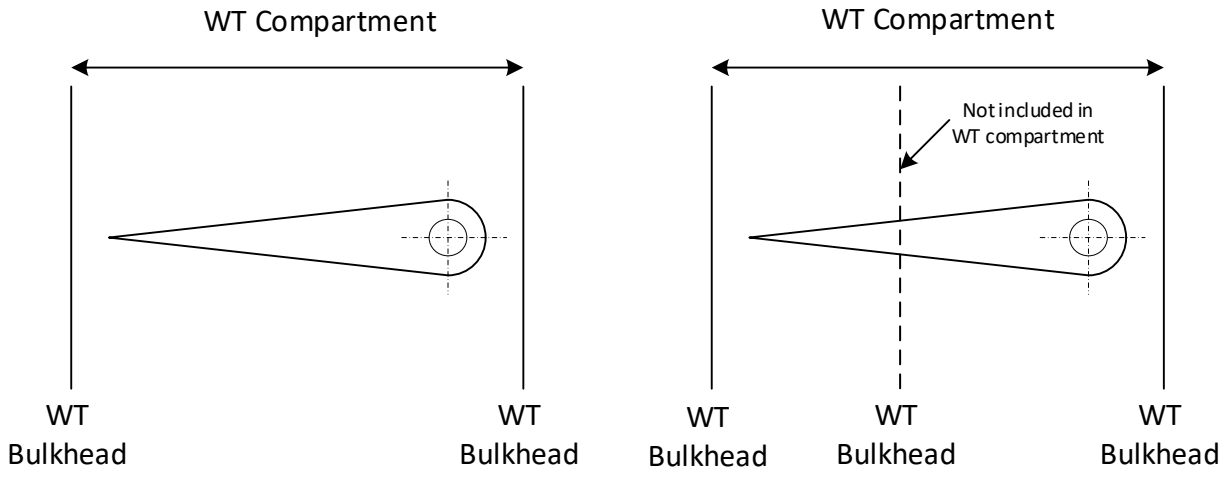


Fig 13.6.1 Stabiliser fin positioning

6.1.4 Shell insert plates are to be fitted in way of stabilisers. The thickness of the insert plate is to be at least 50 per cent greater than the shell thickness in way, and is to extend over a minimum area formed by 1,25 times the stabiliser root chord length '*c*' and covering all operational angles of the fin, *see Figure 9.6.2 Shell insert or increased laminate*. In addition, for retractable stabilisers the insert is to extend beyond the shell opening for a distance of not less than 25 per cent of the length of the root chord. The insert plate is to extend above and below the opening for the stabiliser for a minimum distance equal to the opening height.

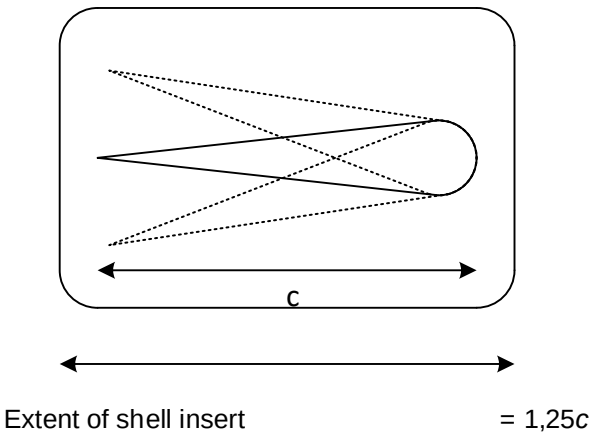


Figure 13.6.2 Shell insert

6.1.5 The stabiliser foundation and surrounding hull structure is to be adequately supported and stiffened, and is to be examined for the following load cases:

(a) Fatigue load. In the absence of a load derived from operational lifecycle data, the fatigue load may be taken as the maximum working load in heavy weather at 90 per cent of the allowable speed *V*, where *V* is defined in *Pt 3, Ch 1, 6.1 Principal particulars*. The fatigue load is additionally not to be taken as less than the maximum working load at zero speed. Nominal bending stress in the structure for the fatigue load is not to exceed 39 N/mm^2 in steel (mild or high-tensile).

(b) Shaft breaking load. The surrounding hull structure is not to yield under this load case. The load is to be applied in both the longitudinal and transverse directions.

6.1.6 Supporting direct calculations are to be submitted for the load cases in *Pt 3, Ch 9, 6.1 Fin stabilisers 6.1.5* demonstrating compliance with the allowable stresses.

6.1.7 Shaft bearing materials and seals are to be of an approved type.

6.1.8 The watertight enclosure into which the stabilisers retract is to have a perimeter plating thickness of the surrounding shell plating plus 2 mm and stiffened to an equivalent standard.

6.1.9 In general, full penetration welds are to be applied in way of the stabiliser pedestal and surrounding hull structure. Welds are to be smooth and notch-free. Construction details are to be carefully designed to avoid structural discontinuities and stress concentrations.

6.1.10 Non-retractable or retracted stabiliser fins are, in general, not to extend beyond the beam of the hull or below the keel.

6.1.11 On ice class ships, non-retractable stabiliser fins are not to be fitted to ships with an **Ice Class 1Cor higher**. Where fitted, the fins are to be positioned at least 500 mm below the ice light waterline in all operating positions.

Part 3, Chapter 16
ShipRight Procedures for the Design, Construction and Lifetime Care of Ships

■ *Section 3*
Structural design assessment

3.1 Structural Design Assessment notation – SDA

(Part only shown)

3.1.1 Where specified in the Rules the ship structure is to be assessed using finite element modelling in accordance with the applicable ShipRight SDA procedures. Where the relevant procedures have been applied whether on a voluntary or mandatory basis the ShipRight notation **SDA** will be assigned, *see also Pt 1, Ch 2, 2.3 Class notations (hull) 2.3.17*. In general the mandatory application criteria for implementation of one of the associated ShipRight SDA procedures is as follows:

(c) container ships with a beam greater than ~~32~~32,26 m;

(h) general cargo ships greater than 100 m in length having a cargo hold of length greater than 50 per cent of the length of the cargo hold area;

Existed listed items (h) and (i) have been renumbered as (i) and (j).

■ *Section 13*
Vibration measurement

13.1 Vibration measurement notation – VIBM

13.1.1 Where structural or machinery vibration has been measured in accordance with the *ShipRight Procedure for Vibration Measurement*, the ShipRight notation **VIBM()** will be assigned, *see also Pt 1, Ch 2, 2.3 Class notations (hull) 2.3.17*. The **VIBM()** notation with the extension of one or more of the following associated supplementary characters shown in brackets may be assigned:

H for hull vibration measurement;

M for machinery vibration measurement.

13.1.2 The **VIBM()** notation does not relate to condition based machinery monitoring.

Part 4, Chapter 1
General Cargo Ships

■ *Section 1*
General

1.3 Class notations

1.3.5 The ShipRight notations SDA (Structural Design Assessment) and subsequently CM (Construction Monitoring) are mandatory for general cargo ships greater than 100 m in length having a cargo hold of length greater than 50 per cent of the length of the cargo hold area, *see Pt 4, Ch 1, 11 Direct calculations*.

Existing paragraph 1.3.5 has been renumbered as 1.3.6.

■ *Section 11*
Direct calculations

11.1 Application

11.1.1 Direct calculations are to be employed in derivation of scantlings for general cargo ships as defined in *Pt 4, Ch 1, 1.3 Class notations 1.3.5*.

11.1.2 Direct calculation methods are also generally to be used where additional calculations are required by the Rules in respect of unusual structural arrangements.

11.2 Procedures

11.2.1 The direct calculations are to be made in accordance with LR's *ShipRight SDA Procedure for General Cargo Ships with a Long Hold*.

■ *Section 3*
Longitudinal strength

3.1 General

3.1.2 The requirements of *Pt 3, Ch 4, 8.3 Loading instrument* regarding loading instruments are not applicable to general cargo ships under 120 m with the exception of ships with the notation **Hatch Covers may be omitted in Hold (No(s) ...)**.

Part 4, Chapter 2
Ferries, Roll On-Roll Off Ships and Passenger Ships

■ *Section 2*
Longitudinal strength

2.4 Design vertical wave bending moments

(Part only shown)

2.4.1 The minimum value of vertical wave bending moment, M_W at any position along the ship may be taken as follows:

f_{fH} $= \frac{1{,}9C_b}{(C_b+0{,}7)}$

~~= R_A is an area ratio factor, *see Pt 4, Ch 2, 2.4 Design vertical wave bending moments 2.4.2*.~~

R_A = *is* an area ratio factor, *see Pt 4, Ch 2, 2.4 Design vertical wave bending moments 2.4.2*.

2.4.4 The stern flare area, A_{SF}, is illustrated in *Figure 2.2.1 Derivation of bow and stern flare areas* and is to be derived as follows:

$A_{SF} = A_{US} - A_{LS}$ ~~m2~~m^2

where

(Part only shown)

= ~~For ships with tumblehome in the stern region, the maximum breadth at any waterline less than $T_{C,U}$ is be used in the calculation of A_{US}. The effects appendages including bossings are to be ignored in the calculation of A_{LS}.~~

Where half the water plane area A_{US} is less than any half water plane area below the waterline $T_{C,U}$ for the longitudinal extents illustrated in *Figure 2.2.1 Derivation of bow and stern flare areas*, for example, in the case of ships with tumblehome in the stern region, the maximum half waterplane area for similar longitudinal extents at any waterline less than $T_{C,U}$ is to be considered as A_{US}.

The effects of appendages including bossings are to be ignored in the calculation of A_{LS}.

Alternately, the impact of stern flare on the design vertical wave bending moment may be specially considered, *see Pt 4, Ch 2, 2.4 Design vertical wave bending moments 2.4.6*.

Figure 2.2.1 has been replaced with the following:

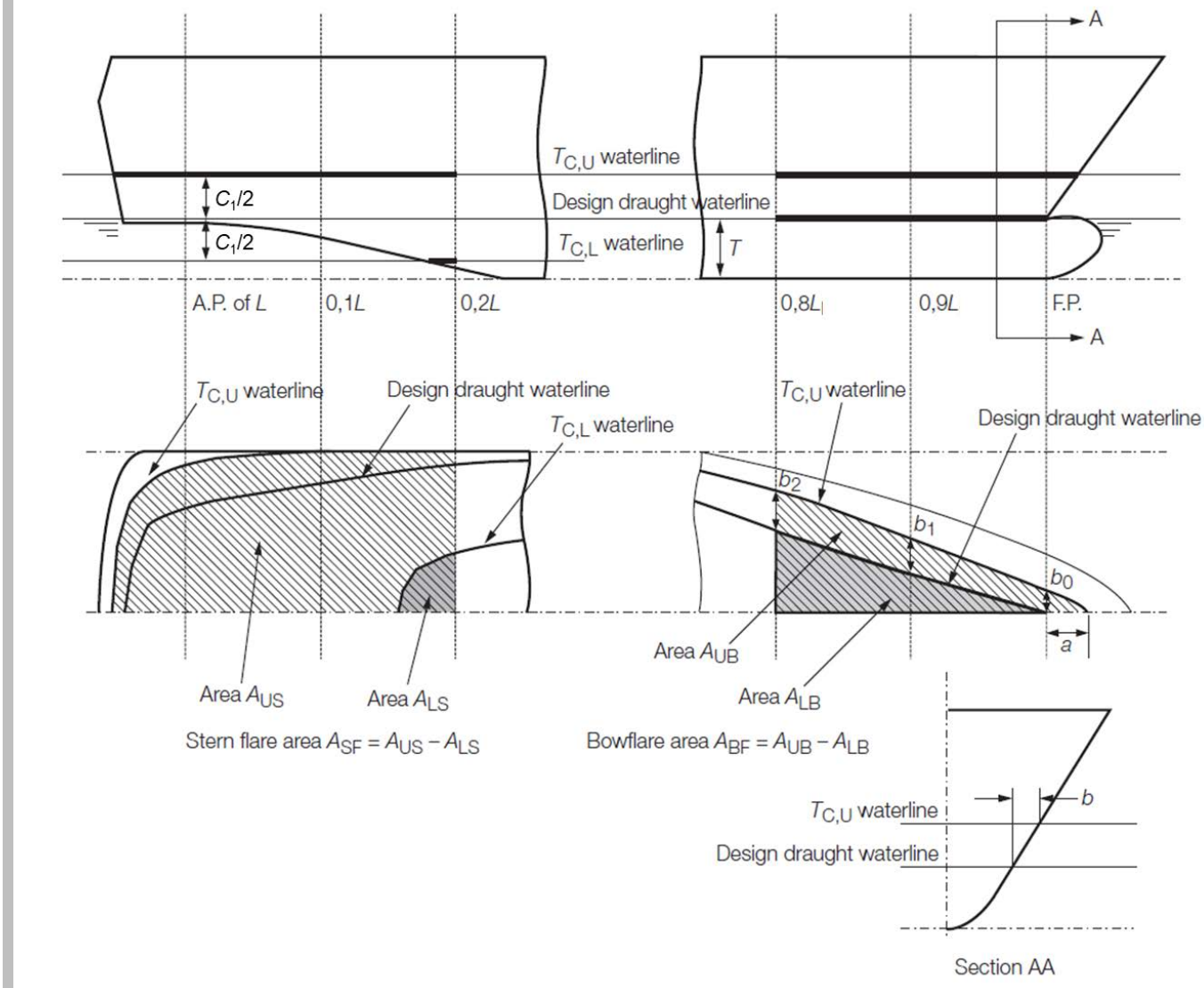


Figure 2.2.1 Derivation of bow and stern flare areas

Part 4, Chapter 7
Bulk Carriers

■ *Section 1*
General

1.4 Class notation for CSR bulk carriers

(Part only shown)

1.4.1 In general, CSR bulk carriers less than 150 m in length are to comply with the requirements of *Pt 4, Ch 7, 1.6 Information required for CSR bulk carriers*, *Pt 3, Ch 2 Materials* and the *IACS Common Structural Rules* ~~(CSR)~~ *(CSR)* and will be eligible for one of the following mandatory class notations:

(b) **100A1 bulk carrier, CSR, ~~hold, nos. 1, 2 ... may be empty,~~ {Holds a, b, … may be empty}, ESP**. This class notation is normally assigned to a ship designed to carry dry bulk cargoes of cargo density 1,0 tonne/m^3 and above with specified holds empty at maximum draught.

(Part only shown)

1.4.2 In general, CSR bulk carriers equal to or greater than 150 m in length are to comply with the requirements of *Pt 4, Ch 7, 1.6 Information required for CSR bulk carriers*, *Pt 3, Ch 2 Materials* and the *IACS Common Structural Rules* ~~(CSR)~~ *(CSR)* and will be eligible for one of the following mandatory class notations:

(a) **100A1 bulk carrier, CSR, BC-A, ~~hold, nos. 1, 2 ... may be empty,~~ {Holds a, b, … may be empty}, GRAB [X] ESP**. This class will be assigned for bulk carriers designed to carry dry bulk cargoes of cargo density 1,0 tonne/m^3 and above with specified holds empty at maximum draught.

(Part only shown)

1.4.3 The following additional notations and annotations are to be provided giving further detailed description of limitations to be observed during operation as a consequence of the design loading condition applied during the design.

- **Notations**:

(a) **~~(maximum cargo density (in tonnes/m^3))~~ {Maximum cargo density in t/m^3}** For notations **BC-A** and **BC-B** if the maximum cargo density is less than 3,0 tonnes/m^3~~,~~.

(b) **~~(no MP)~~ {No MP}** For all notations when the vessel has not been designed for loading and unloading in multiple ports in accordance with the conditions specified in *IACS Common Structural Rules* ~~(CSR)~~ *(CSR)*, Pt 1, Ch 4, Sec 8,4.2.2~~:~~.

I **GRAB [X]** ~~where~~ Where the net thickness of inner bottom, lower strake of hopper tank sloping plate and transverse lower stool plating comply with ~~IACS Common Structural Rules (CSR)~~ *IACS Common Structural Rules (CSR)*, Pt 2, Ch 1, 6 for **BC-A** and **BC-B**, *see IACS Common Structural Rules* ~~(CSR)~~ *(CSR)*, Pt 1, Ch 1, Sec 1,3.2.1~~;~~.

(d) **{Block loading}** For additional service feature **BC-A**, when the ship is intended to operate in alternate block load condition, *see IACS Common Structural Rules (CSR)*, Pt 1, Ch 4, Sec 8, 4.2.3, item d.

Part 4, Chapter 8
Container Ships

■ *Section 1*
General

1.3 Class notations

1.3.3 The ShipRight notations **SDA** (Structural Design Assessment) and subsequently **CM** (Construction Monitoring) are mandatory for container ships with a beam greater than ~~32~~32,26 m or a length greater than 150 m or where the type, size and structural configuration demand, including container ships with narrow side structures, abnormal hull form or unusual structural configuration or complexity.

Part 4, Chapter 8
Container Ships

■ *Section 14*
Direct calculation

14.3 Procedures for verification of structural response due to whipping, springing and fatigue

(Part only shown)

Table 8.14.1 Summary of direct calculation analysis requirements for container ships

Rule requirement *See* Note 1	Rule reference	ShipRight notation	Application criteria. If any of the following criteria apply then the appropriate analysis is required					
			Length criteria	Any of $\|f_{fs}\|$ > 1,55 or f_{bow}> 1,85	$f_c > f_{sp}$	Deck or hatch side coaming steel grade ≥ HT47	Bottom steel grade ≥ HT36 *See* Note 5	Breadth criteria
LR's ShipRight SDA Procedure for container ships	*Pt 4, Ch 8, 1.3 Class notations 1.3.3*	**SDA**	L > 150	—	—	—	—	*B* > ~~32~~32,26
Whipping assessment Level 1 *See Note 4*	*Pt 4, Ch 8, 14.3 Procedures for verification of structural response due to whipping, springing and fatigue 14.3.1*	**WDA1**	—	—	—	—	—	*B* > ~~32~~32,26

Symbols and definitions

f_{sp} is the natural frequency of the 2 node hull girder vertical bending mode in Hz. This can be very approximately calculated as:

~~$= \left(\frac{1,1}{\pi L^2}\right)\sqrt{\frac{EI10^5}{1,8BT_dC_b}}$ Hz~~

$= \left(\frac{1,1}{\pi L^2}\right)\sqrt{\frac{EI_{net}10^5}{1,8BT_dC_{b1}}}$ Hz

~~*V*~~ = speed in knots as defined in *Pt 3, Ch 1, 6.1 Principal particulars 6.1.10*

~~*I* = midship moment of inertia in m^4, *see* *Pt 3, Ch 4 Longitudinal Strength*~~

I_{net} = net midship moment of inertia in m^4, *see* *Pt 4, Ch 8, 16 Longitudinal strength calculations*

T_d = design (normal standard operating) draught, in metres

C_{b1} = moulded block coefficient at draught T_d, based on Rule length, *L*, and moulded breadth, *B*

~~C_b~~, ~~*L*~~, and *B* are given in *Pt 3, Ch 1, 6 Definitions*.

Note ~~4~~4 A Level 2 Whipping Assessment may be carried out instead of a Level 1 Whipping Assessment at the Owner's request. Where a level 2 Whipping Assessment is undertaken, a Level 1 Whipping Assessment need not be carried out.

Note ~~5~~5 This is applicable only when a bottom steel grade greater than or equal to HT36 is needed to satisfy the requirements of *Pt 4, Ch 8, 16 Longitudinal strength calculations*.

Part 4, Chapter 8
Container Ships

■ *Section 15*
Requirements for ships with large deck openings

15.4 Combined stress

15.4.3 For ships with a beam greater than ~~32~~32,26 m, longitudinal stresses are to be calculated using a finite element model of the entire hull in accordance with Part A of the LR's ShipRight SDA procedure for container ships.

(Part only shown)

15.4.4 For ships with a beam less than or equal to ~~32~~32,26 m, the longitudinal stresses may be obtained as follows:

Part 4, Chapter 11
Ore Carriers

■ *Section 13*
Single pass loading

13.1 Scope and application

13.1.2 Where the requirements of this Section have been complied with, then, on application from the Owners, the descriptive note **Single pass loading** may be entered in column 6 of the Register Book, *see Pt 1, Ch 2, 2.8 Descriptive notes*.

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